13 NOV 1980

INVESTIGATION

OF

LOCAL FLOODING PROBLEMS

BELLEVILLE POND SECRET LAKE AREA

ANNAQUATUCKET RIVER BASIN NEAR

WICKFORD, RHODE ISLAND

United States Army
Corps of Engineers
...Serving the Army
...Serving the Nation

New England Division

SEPTEMBER 1980

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AUTHORITY

In response to a request by the State of Rhode Island, a New England Division study team conducted a reconnaissance investigation of flooding and groundwater problems impacting local residents of the Belleville Pond-Secret Lake area of the Annaquatucket River basin near Wickford, Rhode Island. The work was accomplished under the authority of Public Law 93-251 (Section 22). Occupants of private dwellings in the area had complained of sometimes severe flooding in their basements and yards and had further indicated that the problem intensified in recent years. The area was visited by Corps personnel, previously published regional studies were examined, residents of the problem area were interviewed and various town engineers and planners were consulted. The investigation led to the conclusion that the majority of the flood problems were groundwater related and possibly aggrevated by water and land use changes during the past century. This report will describe the physical features of the studied area including its hydrogeology, assess the flooding problem, and discuss the methodology used during the investigation. Conclusions resulting from the study will be discussed and some recommendations for alleviating the problem will be offered.

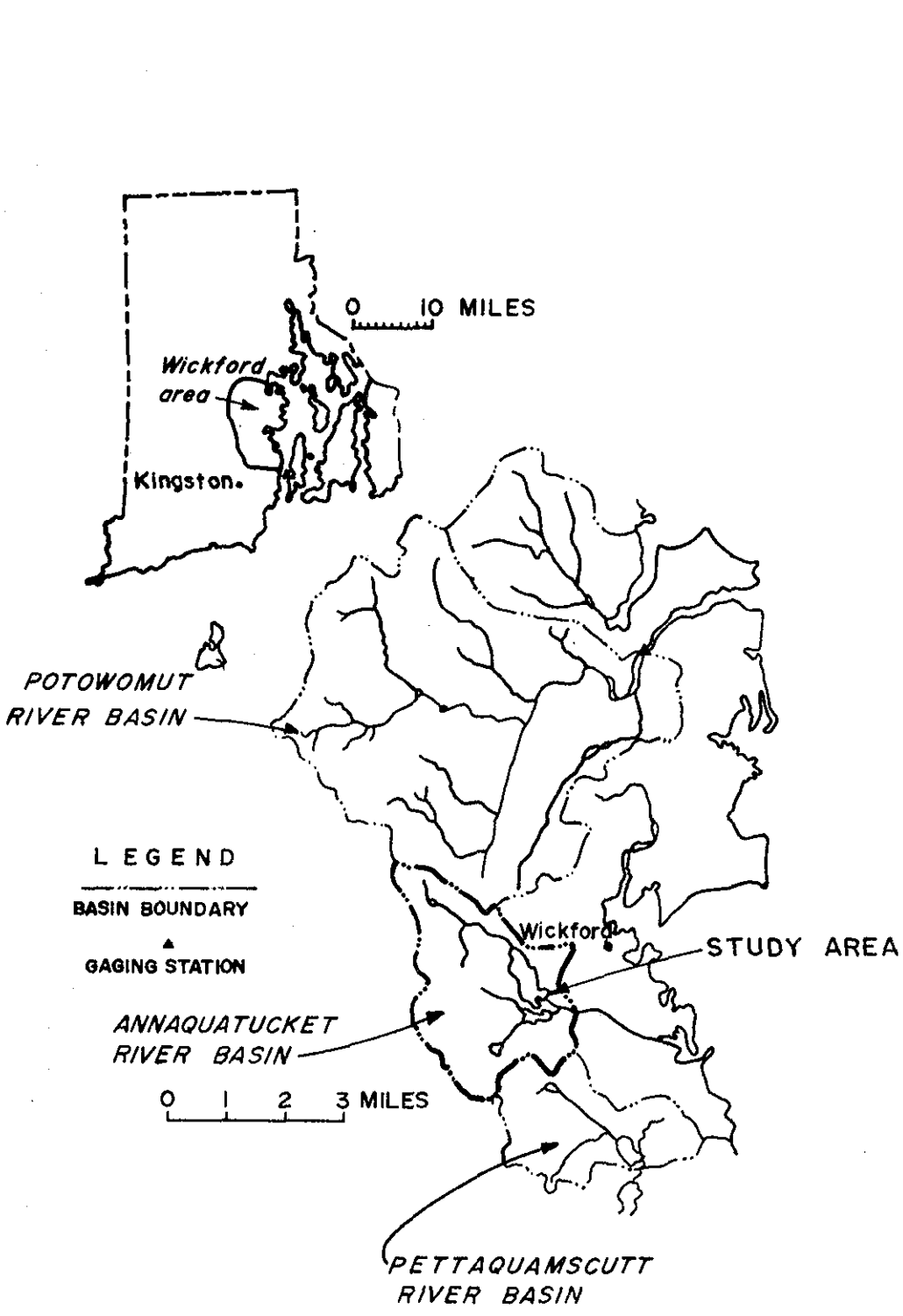
AREA DESCRIPTION

Figure 1 includes both a generalized location map of the Wickford, Rhode Island area and an outline map of the Annaquatucket River basin. The location of the study area is specified on the outline map. A more detailed map of this study area is seen on Figure 2.

The residences visited in the study were located on the block bounded by Sweet Lane and Oak Hill Road. Figure 3, a series of photos of Sweet Lane and Oak Hill Road, well illustrate the flat topography which characterizes the area. Although generally flat, the land does slope gradually to the east away from Belleville Pond and Secret Lake to the extent that the elevation of the lands on which the houses experiencing flooding problems are located is approximately 3 - 8 feet below the level of the lakes.

The geology of the area consists of unconsolidated sediments of glacial origin lying over an irregular bedrock surface. The bedrock consists of a thick sequence of metamorphosed sediments of Pennsylvanian age overlying older crystalline rock. Following the metamorphosis of the sedimentary rock the bedrock was exposed to an extensive period of weathering and erosion which left an undulating surface crossed by several stream valleys.

During the Pleistocene epoch glacial ice advanced over the area several times laying down a base of till (hardpan) on top of which stratified silts, sands and gravels were deposited by the melting ice. These glacial deposits are thickest in the pre-glacial stream channels cut into the bedrock. The glacial sediments in the upper Annaquatucket Basin are mixed tills and stratified drift with till exposed on the top and slopes of higher areas and stratified drift in the lower flatter parts. The glacial deposits in the specific problem area near Sweet Lane and Oak Hill Road consist of stratified sands and gravels of varying thickness lying over hardpan. Records of two test wells drilled in the west part of the study area just east of Belleville Pond and Secret Lake show approximately 27 feet of sand and gravel lying over at least seven feet of hardpan. Deposits of stratified sands and gravels such as these are usually quite permeable. The soil in the problem area has been



WICKFORD, RHODE ISLAND
ANNAQUATUCKET RIVER BASIN
FIGURE 1

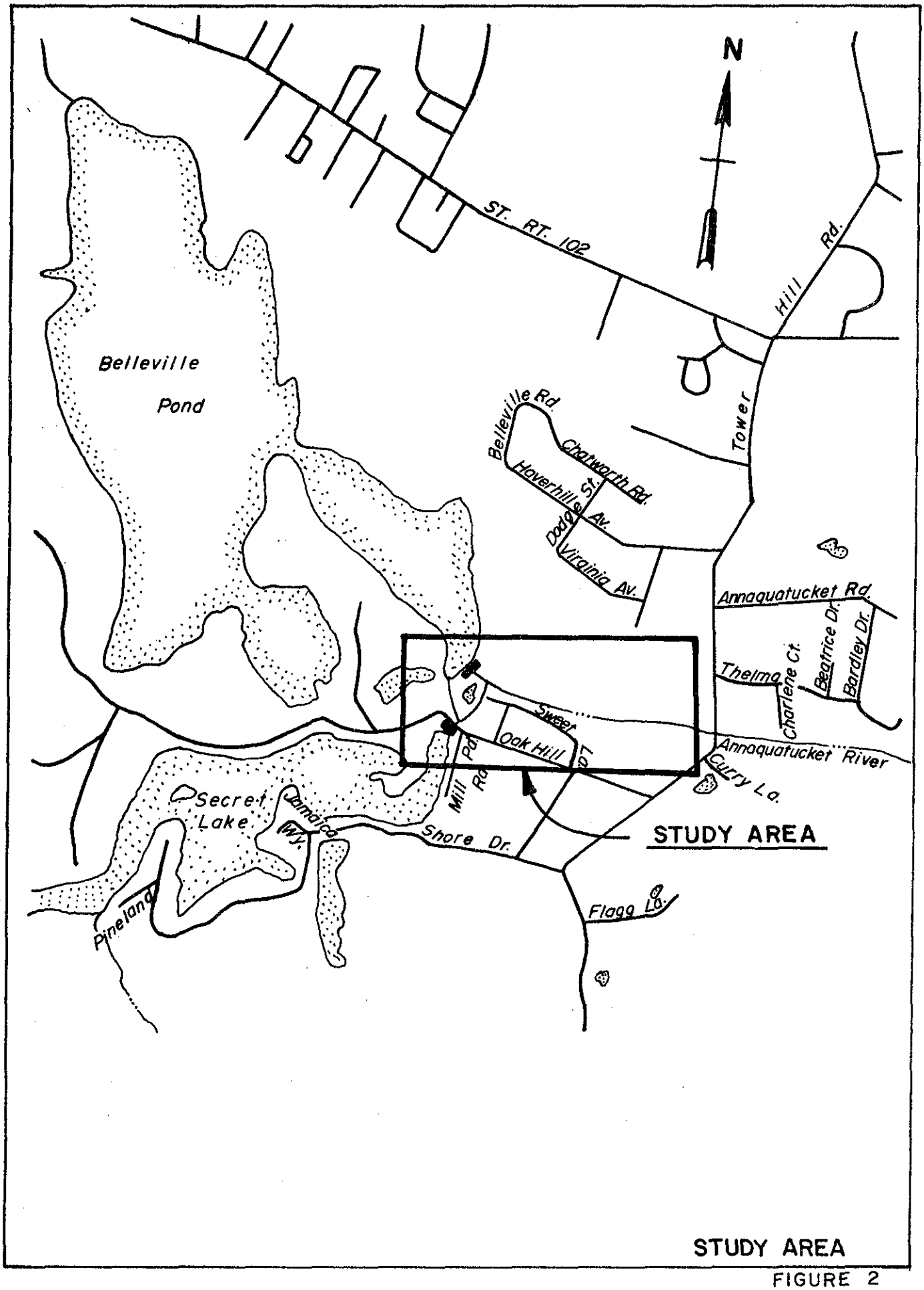
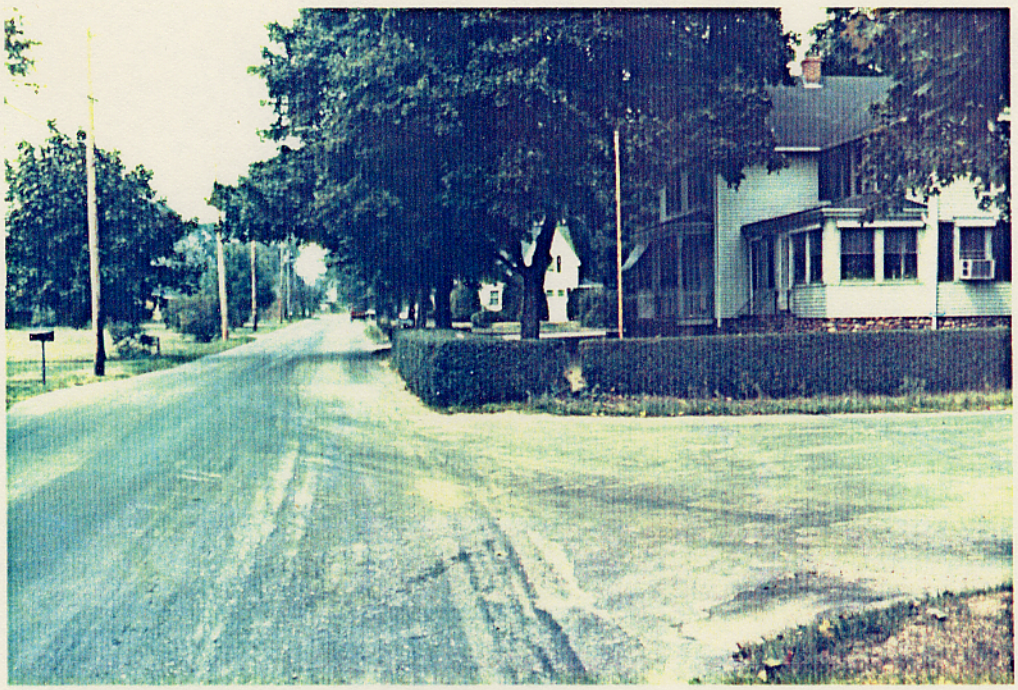

N
ST. RT. 102
Hill Rd.
Belleville Pond
Belleville Rd.
Chatworth Rd.
Haverhill St.
Dodge Av.
Virginia Av.
Tower
Annaquatucket Rd.
Beatrice Dr.
Bardley Dr.
Thelma
Charlene Ct.
Sweet
Oak Hill Rd.
Annaquatucket River
Curry La.
Mill Rd.
Secret Lake
Jamaica Wy.
Shore Dr.
STUDY AREA
Pineland
Flagg Lo.
STUDY AREA

FIGURE 2

SWEET LANE
West side looking north



OAK HILL ROAD
Looking west

FLAT TOPOGRAPHY OF STUDY AREA
Figure 3

classified by the Soil Conservation Service as 'Merrimac Sandy Loam', a soil in which the permeability is moderately rapid to rapid and the water holding capacity is moderate to low. The term droughty is applied to this soil.

HYDROGEOLOGY

Records from the U.S. Weather Bureau Station 4266 at Kingston, Rhode Island show that the average precipitation for the area is 47.9 inches per year. Figure 4 graphically displays the precipitation record for the years 1889 through 1977. The data is further refined as both five and ten year averages. Precipitation in this local region is distributed rather evenly over the year with December and January being only slightly wetter, by about one inch per month, than the "dry" months of June and July. In short, there is no significant wet or dry season.

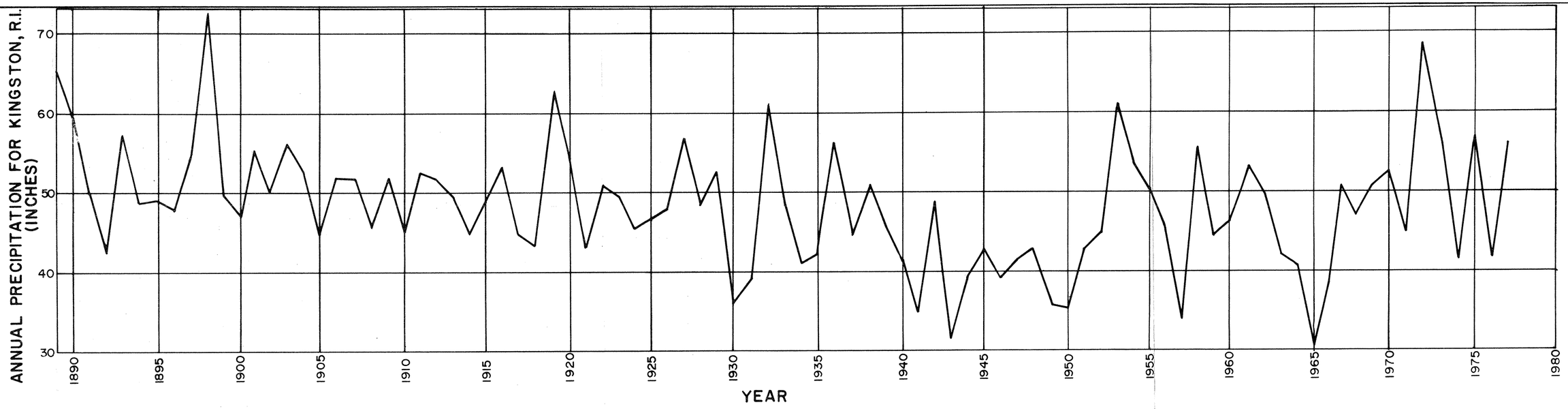
As precipitation falls on the surface it will either be evapotranspired, run off the land as surface flow or infiltrate through the soil and unconsolidated sediments to the water table where it becomes part of the groundwater reservoir. Water leaves the groundwater reservoir through groundwater runoff to surface bodies of water such as ponds, streams and the ocean. Studies by the U.S. Geological Survey indicate that slightly in excess of 50 percent of the water in the Annaquatucket River is contributed by groundwater flow.

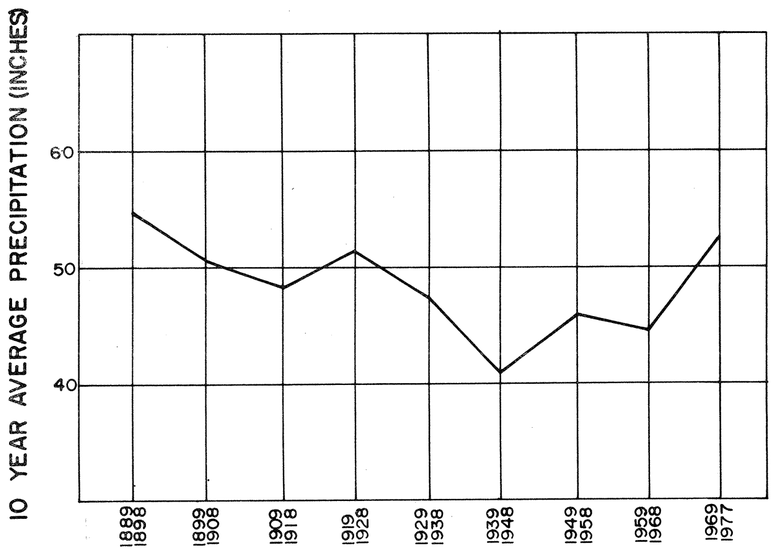
This substantial groundwater runoff component of the water system indicates that groundwater is plentiful in the basin and plays a signficant role in the hydrologic regimen.

Depth to water table and saturated thickness of the stratified drift in and around Belleville Pond-Secret Lake is included in a study of the area published by the U.S. Geological Survey in 1968. This information along with the surface topography is displayed on maps of the area shown in Figures 5a, 5b, and 5c. A geologic cross section along the line A-A' is seen as Figure 6. It is significant that the land surface as well as the water table slope toward the area which has experienced the flooding problems. It is also interesting to note that the saturated thickness narrows markedly under the east end of this area.

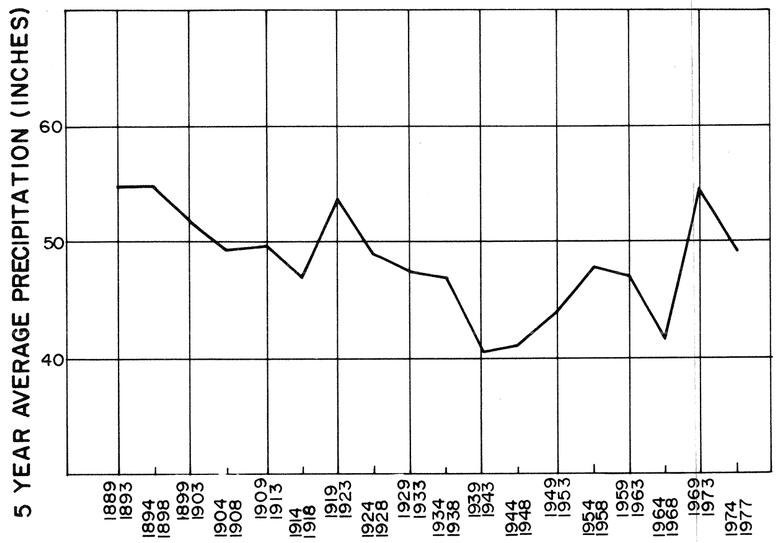
PROBLEM ASSESSMENT

Residents of several houses on Sweet Lane and Oak Hill Road have been subject to flooding in their cellars and/or yards for several years. Figure 7 shows the location of the houses in the study area. The flooding is most severe along the north and west boundaries of this area and presents only occasional minor problems in the southeast part.





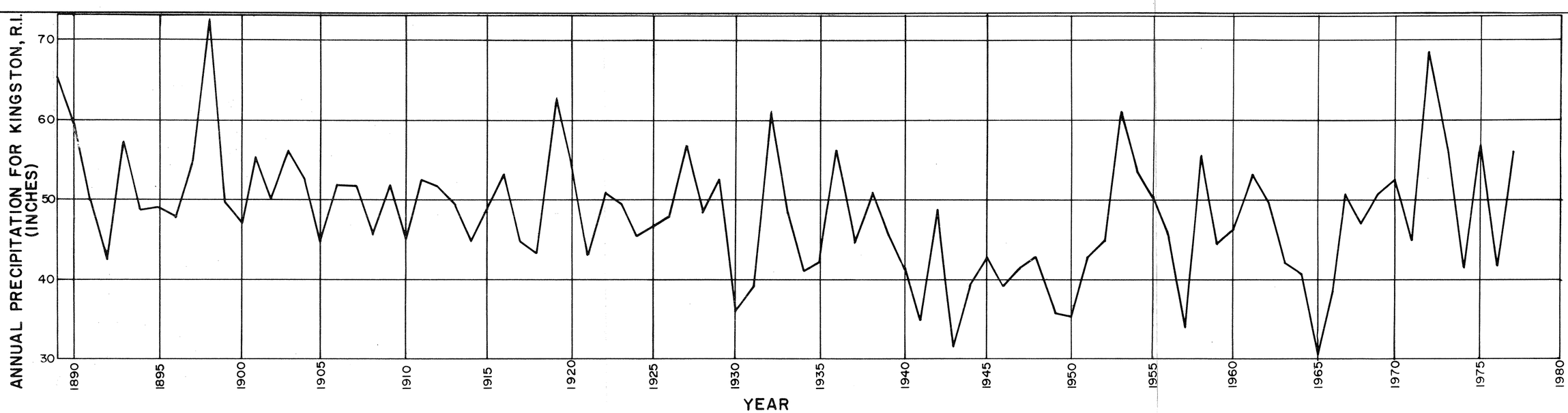
TEN YEAR AVERAGES (1889-1977)



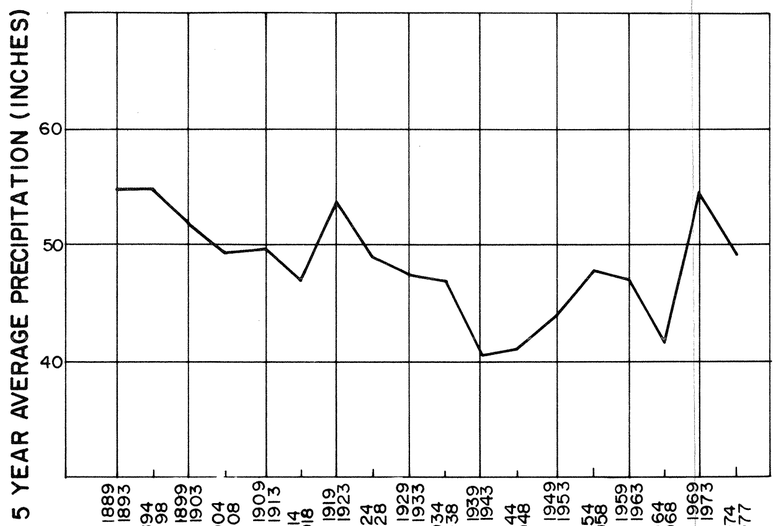
FIVE YEAR AVERAGES (1889 - 1977)

KINGSTON, RHODE ISLAND
PRECIPITATION RECORDS, 1889 to 1977

FIGURE 4

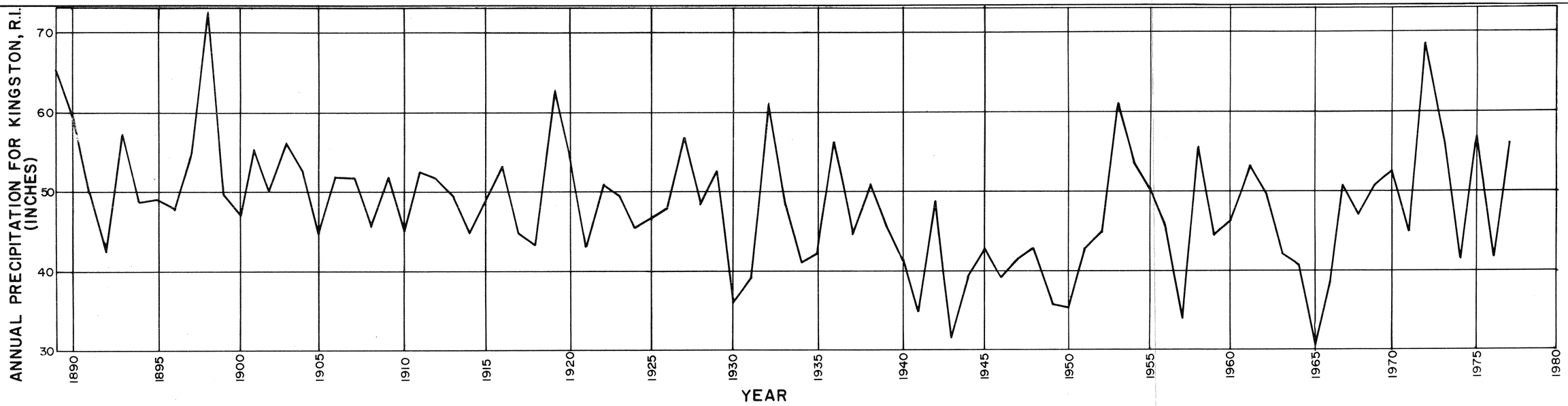


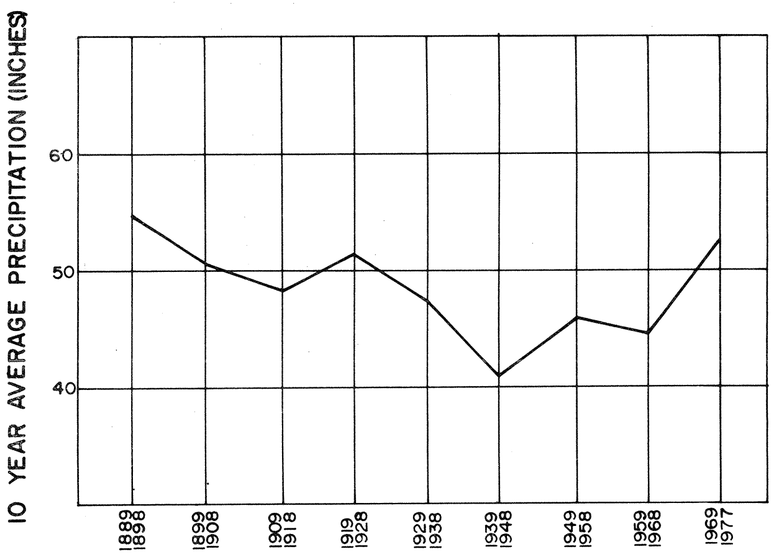
TEN YEAR AVERAGES (1889-1977)

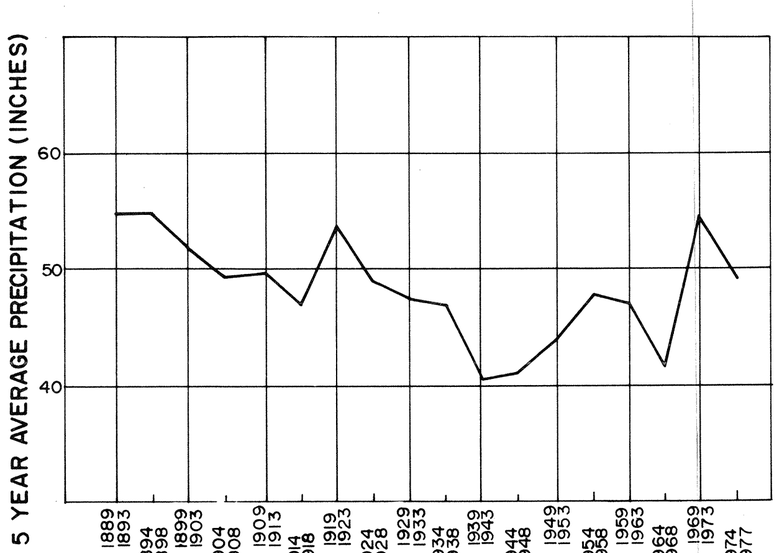


FIVE YEAR AVERAGES (1889 - 1977)

KINGSTON, RHODE ISLAND
PRECIPITATION RECORDS, 1889 to 1977
FIGURE 4







KINGSTON, RHODE ISLAND
PRECIPITATION RECORDS, 1889 to 1977

FIGURE 4

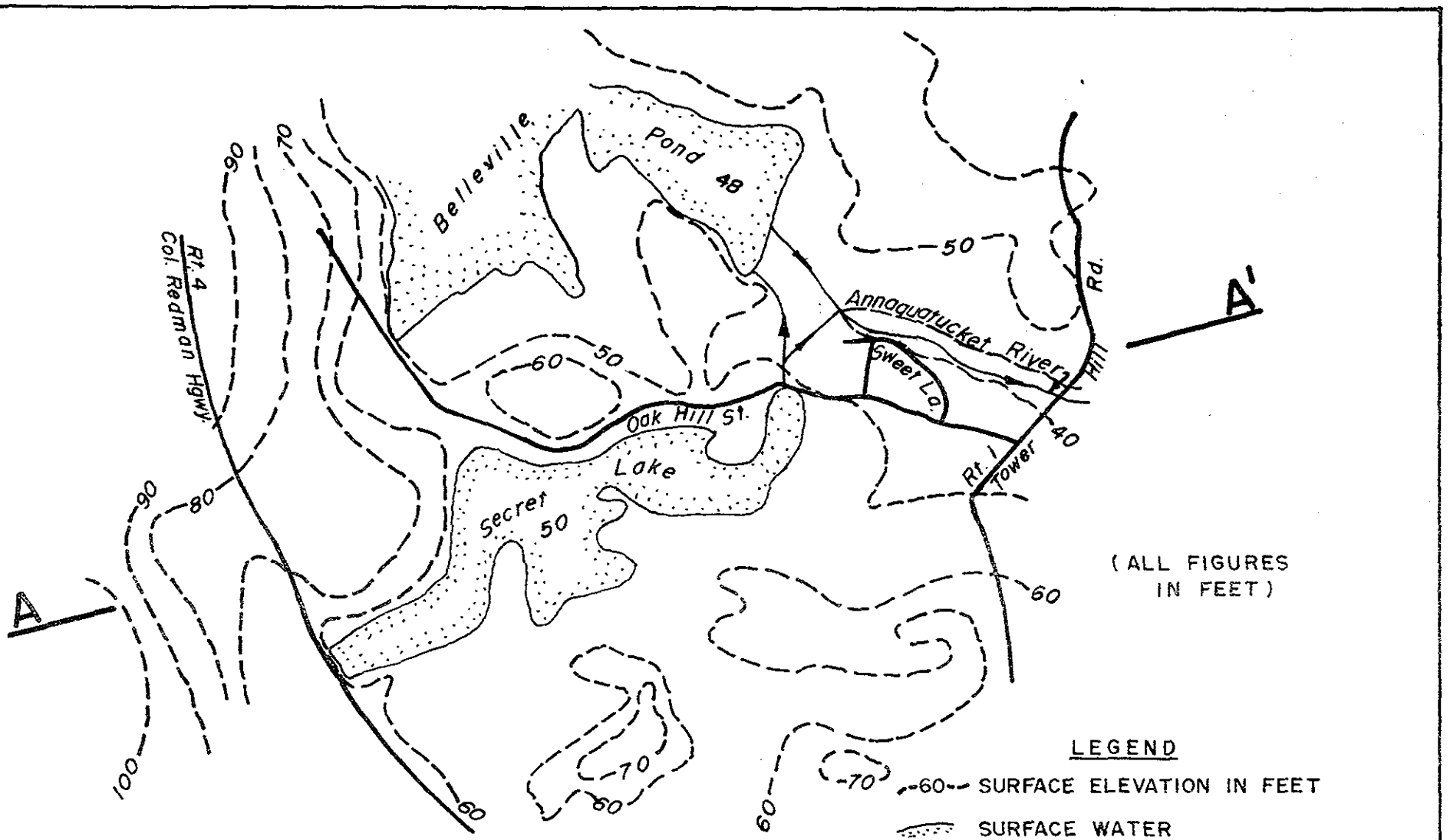


FIGURE 5A

BELLEVILLE POND - SECRET LAKE
SURFACE TOPOGRAPHY

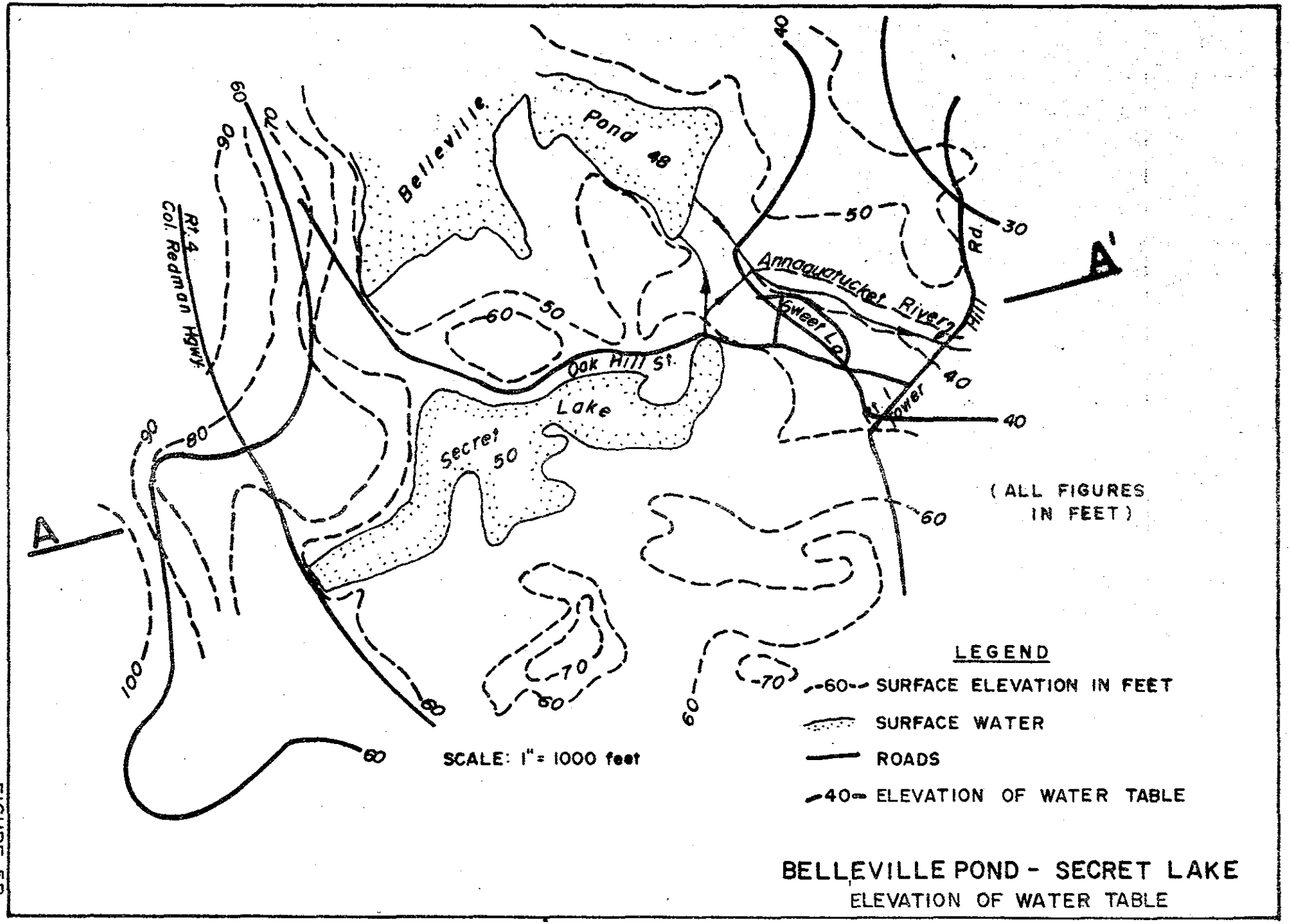


FIGURE 5B

BELLEVILLE POND - SECRET LAKE
ELEVATION OF WATER TABLE

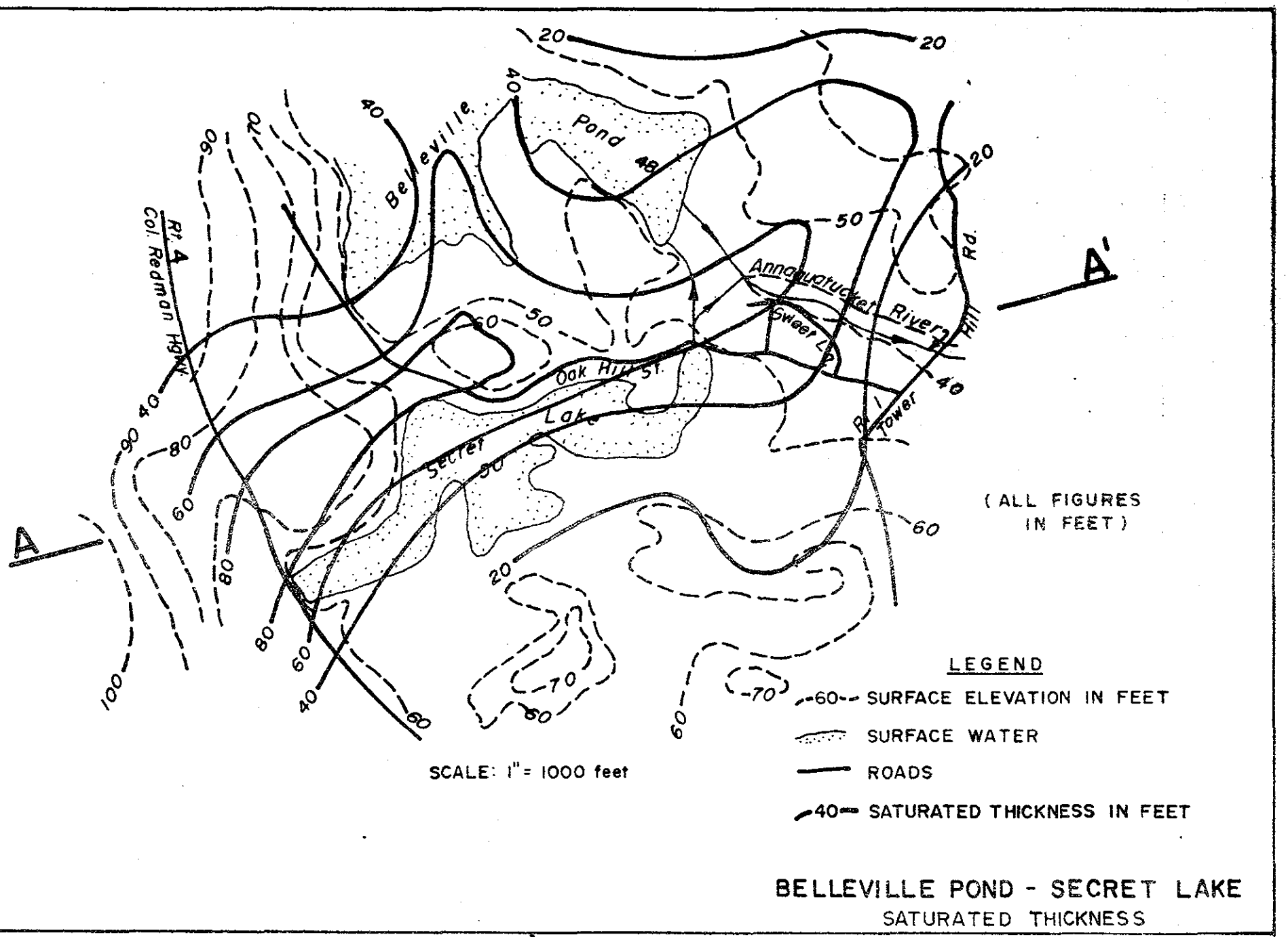
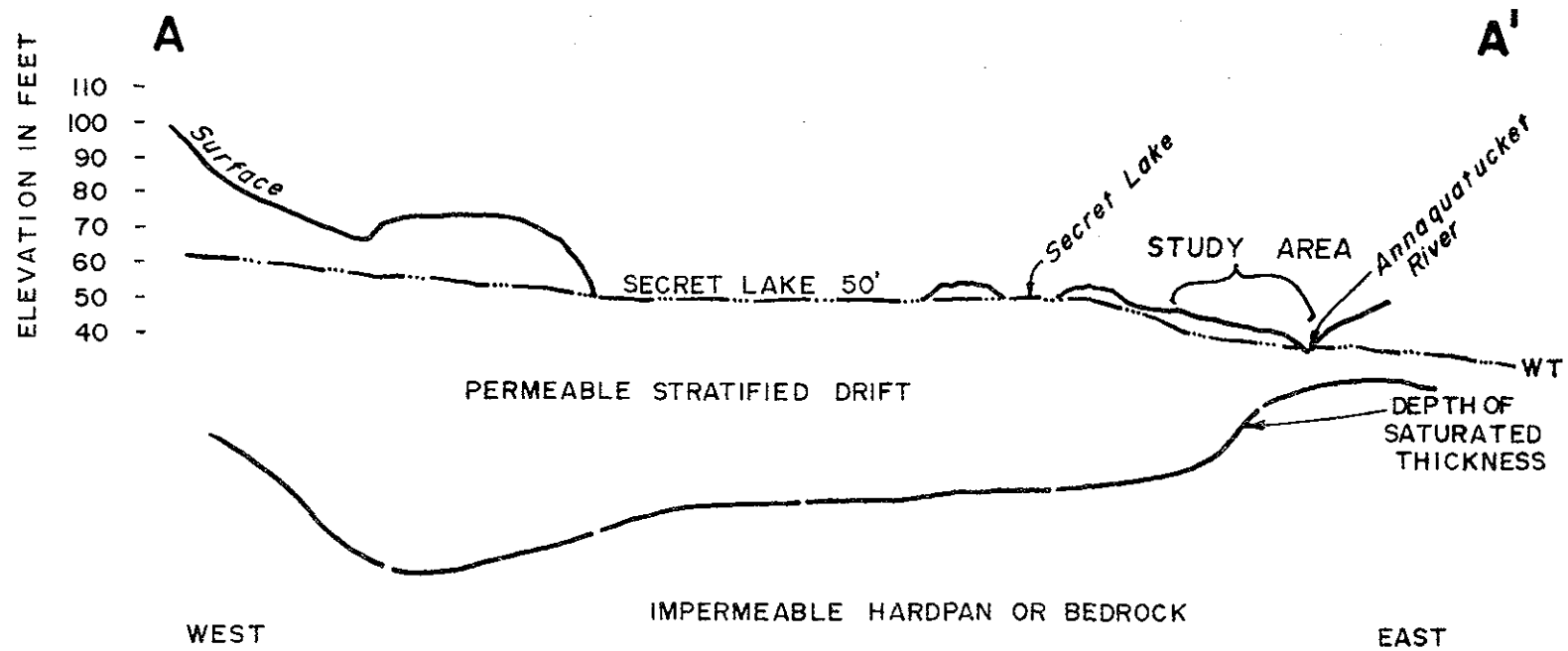


FIGURE 5C

BELLEVILLE POND - SECRET LAKE
SATURATED THICKNESS



HORIZONTAL SCALE : 1"= 1000'
VERTICAL SCALE : 1" = 50'
VERTICAL EXAGGERATION : 20X

FIGURE 6

BELLEVILLE POND-SECRET LAKE
GEOLOGIC SECTION

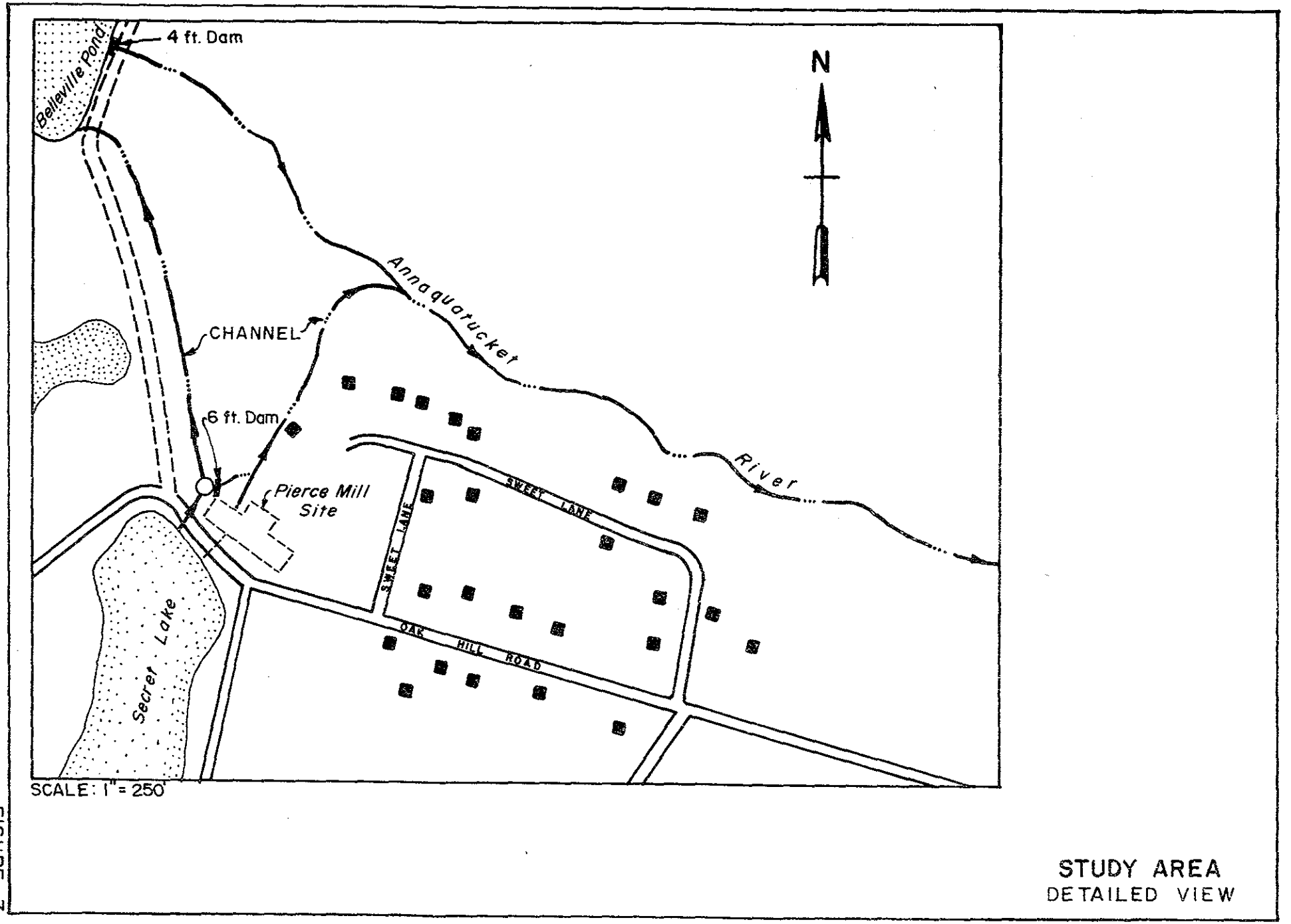


FIGURE 7

STUDY AREA
DETAILED VIEW

Corps personnel visited the area several times, interviewed many of the residents, studied previously published reports concerned with the geology and hydrology of the area, discussed the problem with members of the town engineering and planning departments and consulted histories of the town in the local library.

Pertinent information gained from these investigations can be grouped into two related categories: Nature and duration of flooding and the water use history of the local area. These two categories will be described and the conclusions based upon this information will be stated.

a. Nature and duration of flooding.

Twelve houses in the area were visited and the occupants interviewed. A standard questionnaire was developed and used for all interviews. A copy of that questionnaire is included as Figure 8. Transcripts of all interviews are included as Appendix A. There was general agreement in the interviews on several points.

1. The flooding has occurred in both cellars and yards. The cellar problem is universal and the yard flooding is restricted to those homes along the Annaquatucket and on the south end of Oak Hill Road near Secret Lake.

2. Flooding has occurred for at least forty years and most probably longer.

3. The severity of cellar flooding has either remained constant or intensified in the last 10-12 years.

4. The flooding occurred after heavy rains, commonly in the early spring and fall, often in conjunction with snow melt.

5. The water table, as seen in excavations and well levels, was reported to be from 6 to 10 feet below the surface.

6. The water supply is town water and the source is outside of the study area. Septic tanks are used within the study area.

7. The severity of cellar flooding ranges from slight (1 or 2 inches) to severe (2 or 3 feet). Most reports indicate that the flooding was caused by rising groundwater as opposed to surface runoff leaking through walls.

8. Changes and modification to the land and waterways over the past several tens of years have influenced the nature and severity of flooding. Many of those interviewed mentioned that a woolen mill, formerly located on the north side of Oak Hill Road across from the north east tip of Secret Lake, was a heavy user of water from Secret Lake and that since the mill was demolished in 1968, the flooding problems have intensified.

b. Past History

The frequent allusions to the mill (hereafter referred to in this report as the Pierce Mill) and "the way they used to do things," prompted an investigation

QUESTIONNAIRE

NAME_____ ADDRESS_____

AGE OF HOUSE_____ TYPE OF BASEMENT

SLAB____ DIRT____ FLOORED CELLAR___

PROBLEMS WITH FLOODING? BASEMENT_____ YARD_____

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM_____

IS INTENSITY CHANGING?_____ HOW?_____

FREQUENCY OF OCCURRENCE_____

SEVERITY - DEPTH OF FLOOD WATER _____

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE?_____

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD?_____

WHAT DO YOU BELIEVE CAUSES THE FLOODING?_____

_____

Figure 8

of the change in water use in the area over the past century. Results of this investigation included the following:

1. The waters of the Annaquatucket have been heavily used by industry in the past. In the approximately 1 3/4 mile reach of the river between Belleville Pond-Secret Lake and its outlet to Narragansett Bay, there are five sites at which are located dam and/or remains of mills.

2. The Pierce Mill was located on Oak Hill Road near Secret Lake. The specific location is outlined on Figure 7. Field reconnaissance of the land between Secret Lake and Belleville Pond showed the existance of two channels not seen on the U.S. Geological Survey topographic map of the area. Both of these channels are also shown on Figure 7. One channel connects Secret Lake to Belleville Pond and the other runs from Secret Lake to the 'mainstem' of the Annaquatucket. This latter channel begins at the six foot dam in the channel between Secret Lake and Belleville Pond (see figure 7). The channel leading to the Annaquatucket now contains only a trickle but must have supported substantial flow in the past since a good part of its bank walls have been reinforced and covered with stone and mortar. Presumably this channel was used as water was taken from Secret Lake, used during the mill operation and then shunted to the Annaquatucket. The Pierce mill was built on the site of a previous mill in 1861 and was razed in 1968.

3. An old physiographic map of the Wickford area (c 1850) shows no outlet of Belleville Pond to the Annaquatucket and does show the two channels leading from Secret Lake discussed in Section 2 immediately above. A member of the Kingston Planning Department indicated that the Schwartz Mill (on Route 102 at the North end of Belleville Pond) was constructed in 1878. This mill had a very large operation and must have needed a steady supply of water. It is possible that the dam now situated at the southeast end of Belleville Pond was constructed for or by the Schwartz Mill to guarantee a constant supply of water. This construction would have created a new stretch of the Annaquatucket from Belleville Pond to just northwest of the present study area. This conjecture concerning the dam is just speculation but it is reinforced by the path of the Annaquatucket shown on the old map discussed at the beginning of this section.

4. The present heavy tree growth around Belleville Pond and presumably most of the general area is, according to the Planning Department of North Kingston, mostly second growth. This observation is reinforced by historical records showing that during the Civil War the trains in the area used hay rather than wood for fuel. Assuming that forest cover was noticably less a century ago, there is a good chance that surface runoff was higher in the past than now.

CONCLUSIONS

The information gathered in the above described investigation leads to the conclusion that the flood problems in the study area are groundwater induced and very possibly intensified by recent changes in the water use of the region. The water table in the area is naturally high as seen by the cross section of Figure 6.

The combination of heavy rains and permeable soil and subsoil material allows a rather rapid rise in the water table, causing flooding of some cellars and a spill over to yard areas near the river and lake. This very natural event is intensified in this particular area by the slope of both the land and water table surfaces. Since water flows downhill, both above and below the ground, the sloping towards the houses increases the likelihood of the water table rising to flood levels and causing problems.

Another factor in the hydrologic setting which may contribute to the flooding is the change in saturated thickness underneath the problem area as seen on the cross section of Figure 6. The material below the saturated thickness zone is relatively impermeable and since the permeable area thins very rapidly underneath the problem area there might exist a bottleneck effect during times of heavy precipitation or snow melt. The thin zone of permeable soil underneath the problem area will get filled up rather quickly causing a rapid rise in the water table and consequent flooding. The existing structure and distribution of soil material and groundwater in the area is, then, very conducive to groundwater rise and basement flooding.

The history of the area helps to explain why, in many people's opinion, the flood problems have increased. The changes in the hydrology of the area caused by man's activity over the past century are substantial and it is a conclusion of this report that these changes have created a pattern which has increased the likelihood of flooding in the problem area. The denudation of forest land during Civil War time very well may have caused more surface runoff at the expense of transpiration and groundwater infiltration. Simply stated, more water left the area more quickly 100 years ago than it does now. As a result more water now becomes groundwater and the probability of groundwater related flooding increases.

The Pierce Mill on Oak Hill Road (1861-1968) apparently used water in such a manner that it too caused water to leave the area faster than if the mill was not there. The presence of the dam on the channel nearest the mill (see Figure 7) and the mortar and stone lining of the channel all suggest heavy water flow. This implies that water was removed from Secret Lake, used by the mill, and then channelled out of the area. The net effect was to increase surface flow and decrease groundwater imput in a similar fashion to the effect of the above described forest denudation.

Another factor influencing the groundwater levels in the area is the amount of precipitation. As can be seen from the precipitation graphs of Figure 4 the drought of the middle 1960's has been followed by a rather rapid increase in precipitation. The cumulative effect of the rainfall deficits during this drought resulted in abnormally low groundwater levels and almost certainly a marked lessening of groundwater flood problems in the study area. Once the drought ended, however, the water table began to rise and the "old" flooding problems began to reassert themselves.

There is ample support here for those who have claimed that their flooding problems have intensified in recent years. In the long run the forest cover has grown back, possibly leading to increased groundwater recharge and in the short run the mill closed down in 1968, thus ceasing rapid removal of water

from the area via the drainage channel to the Annaquatucket. Coincidentally, but very significantly, the drought ended just before the mill was razed and the combination of the two events very well may have caused a noticable increase in the flooding problems.

RECOMMENDATIONS

It is recommended that an investigation of the following flood control measures be performed in order to determine the most feasible and cost effective method for alleviating the flooding in the study area. Two or more of these suggested measures used in combination may prove to be the best solution.

. Clearing of the channel of the Annaquatucket River in order to allow for more rapid discharge of water from the area.

. Regulation of the levels of Belleville Pond and Secret Lake in anticipation of spring runoff. The lake level might be lowered in the fall so that snowmelt would be prevented from raising the lakes to excessive levels.

. Regulation of the outflow from both lakes during time of snowmelt and heavy precipitation. This would permit water to flow more rapidly from the lakes and out of the local area and help prevent a rapid rise in the water table.

. Installation of an under drain system to discharge groundwater from the study area to the Annaquatucket River before any serious flooding could occur.

. Individual house flood prevention measures.

1. Installation of sump pumps
2. Construction of concrete slabs in cellars
3. Raising of cellar floors

The magnitude of the problem and the area effected must be kept in perspective when considering possible solutions. For example a complete network of under drains might do an excellent job of prevently basement flooding in the area, but the cost may be excessive.

ACKNOWLEDGEMENTS

This report was prepared by a study team from the Basin Management Branch, Planning Division, New England Division, Corps of Engineers, Waltham, Massachusetts. The team consisted of Dr. Franklin Fessenden assisted by Ms. Clair Adams acting under the general direction of Mr. Arthur Doyle.

The advice and assistance of Ms. Cheryl Friend, Senior Planner, as well as members from the Engineering Department and town library, all of North Kingston, Rhode Island, are gratefully acknowledged. The residents of the study area were most helpful and cooperative in assisting the members of the study team in their efforts.

APPENDIX A

QUESTIONNAIRE REPLIES

31 July 1980

QUESTIONNAIRE

NAME D. Mignella ADDRESS 85 Sweet Lane

AGE OF HOUSE 1830-1860 TYPE OF BASEMENT

SLAB X DIRT X FLOORED CELLAR ___

PROBLEMS WITH FLOODING? BASEMENT X YARD ___

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM ?

IS INTENSITY CHANGING? ___ HOW? ___

FREQUENCY OF OCCURRENCE Several

SEVERITY - DEPTH OF FLOOD WATER 3 - 4 " in basement

DURATION OF INDIVIDUAL FLOODS 3 - 4 days

ANY PARTICULAR TIME (S) OF OCCURRENCE? After heavy rains in spring and fall.

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL ___

ANY PROBLEMS WITH LEACHING FIELD? Minor drainage problem - ground always wet

WHAT DO YOU BELIEVE CAUSES THE FLOODING? Heavy rains

Well in basement - shows water level 4' down.

Sometimes after heavy rain occupant will get water in basement even though river water is not high.

Occupant is of the opinion that ladders in brook might contribute to the problem.

QUESTIONNAIRE

NAME Ellsworth ADDRESS 39 Sweet Lane

AGE OF HOUSE 150 + TYPE OF BASEMENT

SLAB ____ DIRT X FLOORED CELLAR ____

PROBLEMS WITH FLOODING? BASEMENT X YARD X added 3 1/2' of fill to replace loss due to Flooding

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM Long term

IS INTENSITY CHANGING? NO HOW? ____

FREQUENCY OF OCCURRENCE Several

SEVERITY - DEPTH OF FLOOD WATER Almost to furnace - sump always has water.

DURATION OF INDIVIDUAL FLOODS ____

ANY PARTICULAR TIME (S) OF OCCURRENCE? rain and thaw

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL ____

ANY PROBLEMS WITH LEACHING FIELD? When flooding really is bad

WHAT DO YOU BELIEVE CAUSES THE FLOODING? ____

When they built pool (3 years ago) they hit groundwater at 6' in April.

When the mill is running the flooding is less severe. The dirt floor is always damp. Water comes up from the floor.

31 July 1980

QUESTIONNAIRE

NAME R. Houston ADDRESS 29 Sweet Lane

AGE OF HOUSE _____ TYPE OF BASEMENT

SLAB ____ DIRT ____ FLOORED CELLAR ____

PROBLEMS WITH FLOODING? BASEMENT _____ YARD _____

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM _____

IS INTENSITY CHANGING? _____ HOW? _____

FREQUENCY OF OCCURRENCE _____

SEVERITY - DEPTH OF FLOOD WATER _____

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE? _____

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

The well is in the basement. The water gushes out of the well at flood times. - Told by Wilcox,

31 July 1980

Spoke with woman who had lived here 10 years.

QUESTIONNAIRE

NAME L. Kelley ADDRESS 105 Oak Mill

AGE OF HOUSE 90 TYPE OF BASEMENT

SLAB ___ DIRT X FLOORED CELLAR ___

PROBLEMS WITH FLOODING? BASEMENT X YARD ___

moisture

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM at least 10 years

IS INTENSITY CHANGING? ___ HOW? ___

FREQUENCY OF OCCURRENCE several

SEVERITY - DEPTH OF FLOOD WATER slight

DURATION OF INDIVIDUAL FLOODS 2 days

ANY PARTICULAR TIME (S) OF OCCURRENCE? Rains - thaw

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL ___

ANY PROBLEMS WITH LEACHING FIELD? ___

WHAT DO YOU BELIEVE CAUSES THE FLOODING? ___

Some slight moisture in cellar (groundwater)

99 Oak Mill has no probelm - they have a cement basement.

18 July 1980

QUESTIONNAIRE

NAME _____ ADDRESS 89 Sweet Lane

AGE OF HOUSE 100 years + TYPE OF BASEMENT

SLAB ___ DIRT ___ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT X YARD X

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM _____

IS INTENSITY CHANGING? Yes HOW? worse lately

FREQUENCY OF OCCURRENCE Spring and fall, after heavy rains

SEVERITY - DEPTH OF FLOOD WATER backyard inundated

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE? Fall and spring

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

The problem seems worse in the past several years. Resident believes that as the river became more clogged with refuse and as more structural changes occurred such as - fish ladders, the worse the flooding became.

QUESTIONNAIRE

NAME _____ ADDRESS 70 Oak Mill

AGE OF HOUSE Early 1950's TYPE OF BASEMENT

SLAB ____ DIRT ____ FLOORED CELLAR ____

PROBLEMS WITH FLOODING? BASEMENT _____ YARD _____

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM since 1955

IS INTENSITY CHANGING? _____ HOW? _____

FREQUENCY OF OCCURRENCE Occasional

SEVERITY - DEPTH OF FLOOD WATER _____

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE? _____

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

Noted that the problem seemed less severe when the mill was running.

Recently excavated for the installation of an oil tank - down to the depth of seven feet. No water encountered. Subsoil was sand and gravel.

31 July 80

QUESTIONNAIRE

NAME R. Waldek ADDRESS 72 Sweet Lane

AGE OF HOUSE 1971 TYPE OF BASEMENT

SLAB ____ DIRT ____ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT X YARD Minor

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM as long as family there - 6 years

IS INTENSITY CHANGING? _____ HOW? _____

FREQUENCY OF OCCURRENCE _____

SEVERITY - DEPTH OF FLOOD WATER 1 1/2 feet before raised cellar floor

DURATION OF INDIVIDUAL FLOODS 2 days

ANY PARTICULAR TIME (S) OF OCCURRENCE? heavy rains

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? No

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

Raised cellar floor 6". Groundwater seeps up through floor, has sump pump.

Questions answered by 12 year old boy 31 July 1980

QUESTIONNAIRE

NAME Gene Hammonds ADDRESS 82 Sweet Lane

AGE OF HOUSE 1971 TYPE OF BASEMENT

SLAB ____ DIRT ____ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT _____ YARD _____

DESCRIPTION OF FLOODING: No

DURATION OF PROBLEM _____

IS INTENSITY CHANGING? _____ HOW? _____

FREQUENCY OF OCCURRENCE _____

SEVERITY - DEPTH OF FLOOD WATER _____

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE? _____

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

This family moved in February 1980. Have had no problems. Did not hear of problems from previous owner.

Backyard slopes to Waldek (72 Sweet - next door), - a drainage ditch between properties leads to Sweet Road.

QUESTIONNAIRE

NAME Kitchin ADDRESS 121 Sweet Lane (red house at end of lane)

AGE OF HOUSE (looks old - 80+) TYPE OF BASEMENT

SLAB ___ DIRT ___ FLOORED CELLAR ___X

PROBLEMS WITH FLOODING? BASEMENT ___X___ YARD little in yard

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM at least 7 years

IS INTENSITY CHANGING? - HOW? -

FREQUENCY OF OCCURRENCE Several per year

SEVERITY - DEPTH OF FLOOD WATER 2-3 feet recently after heavy snow; usually 1-2" in cellar

DURATION OF INDIVIDUAL FLOODS ~~2 - 3 days~~

ANY PARTICULAR TIME (S) OF OCCURRENCE? ~~after rain and snow~~ melt

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

Answered by 11 year old boy who has lived there 7 years.

QUESTIONNAIRE

NAME _____ ADDRESS 127 Oak Street

AGE OF HOUSE 100 years + TYPE OF BASEMENT

SLAB ____ DIRT ____ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT X YARD X

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM at least since 1944

IS INTENSITY CHANGING? No HOW? _____

FREQUENCY OF OCCURRENCE Several per year

SEVERITY - DEPTH OF FLOOD WATER 6" in back yard, severe in cellar

DURATION OF INDIVIDUAL FLOODS _____

ANY PARTICULAR TIME (S) OF OCCURRENCE? after heavy rain and/or snow melt

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

_____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

_____

31 July 1980

QUESTIONNAIRE

NAME _____ ADDRESS 31 Sweet Lane

AGE OF HOUSE 80 - 100+ TYPE OF BASEMENT

SLAB ___ DIRT ___ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT X YARD _____

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM _____

IS INTENSITY CHANGING? _____ HOW? _____

FREQUENCY OF OCCURRENCE Occasional

SEVERITY - DEPTH OF FLOOD WATER 1.5 feet in basement

DURATION OF INDIVIDUAL FLOODS One or two days

ANY PARTICULAR TIME (S) OF OCCURRENCE? after heavy rains and/or spring thaw

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL _____

ANY PROBLEMS WITH LEACHING FIELD? _____

WHAT DO YOU BELIEVE CAUSES THE FLOODING? _____

31 July 1980

QUESTIONNAIRE

NAME Raymond Wilcox ADDRESS 50 Sweet Lane

AGE OF HOUSE 1963 TYPE OF BASEMENT

SLAB ___ DIRT ___ FLOORED CELLAR X

PROBLEMS WITH FLOODING? BASEMENT X YARD ___

DESCRIPTION OF FLOODING:

DURATION OF PROBLEM 16 years

IS INTENSITY CHANGING? X HOW? Worse since mill closed

FREQUENCY OF OCCURRENCE several / year

SEVERITY - DEPTH OF FLOOD WATER Pumps control it - but did reach 3 feet ~~prior to~~ pumps

DURATION OF INDIVIDUAL FLOODS week

ANY PARTICULAR TIME (S) OF OCCURRENCE? after rain; snow drain worst

TOWN SEWERAGE OR SEPTIC SYSTEM / TOWN WATER OR PRIVATE WELL ___

ANY PROBLEMS WITH LEACHING FIELD? No (only two people)

WHAT DO YOU BELIEVE CAUSES THE FLOODING? "one mill closed-water in Secret Lake builds up causing a great pressure".

"No floods when he was a boy" - now 80 + ? years old. A surface flood would occur sometime at Oak Mill Street.